



Nanchang University
CS317: Operating Systems
(Last Updated in Jan. 2024)

Credit: 4

Contact Hours

This course is composed of 24 lecture sessions, 3 tutorial sessions and 9 office contact hours. Each lecture session takes 2 contact hours in length; each tutorial session takes 3 contact hours in length; There will be a Q-A review session(3 contact hours) and Final Exam (3 contact hours) at the end of this term. This course has 72 contact hours in total.

Course Description

An Operating System is software that manages and handles the hardware and software resources of a computer system. It provides interaction between users of computers and computer hardware. This course introduces the basic facilities provided by modern operating systems with the emphasis on process management, concurrency, memory management and file systems. Other topics will be introduced if time permits.

After completion of this course, students will be able to

1. Have a good understanding of the main elements that work together to form an Operating System.
2. Define different operating system design techniques.
3. Understand how to manage multiple tasks that execute at the same time and share resources.
4. Explain the difference between containerization and virtualization.
5. Comprehend the various memory management systems
6. Understand the concept of a file, and how to access, organize, and protect files
7. Have significant experience with C programming for low-level OS development

Note: This Syllabus is subject to change based on the needs of the class.

Required Textbook

Textbook:

Operating Systems: Principles and Practice by Thomas Anderson and Michael Dahlin

Operating Systems: Three Easy Pieces by Remzi H. Arpaci-Dusseau and Andrea C Arpaci-Dusseau.

Grading



- Participation 5%
- Assignments 20%
- Mini Project 20%
- Midterm 20%
- Final Exam 35%

A+ 96-100	A 90-95	A- 85-89
B+ 82-84	B 78-81	B- 75-77
C+ 71-74	C 66-70	C- 62-65
D 60-61	F < 60	

Course Schedule

The course has 24 class sessions in total. All sessions are 2 contact hours in length. At the end of this term, there will be a Q-A review session(3 contact hours) and Final Exam (3 contact hours).

Note: the course outline and required readings are subject to change.

Class 1

Introduction to Operating System

Class 2

The Kernel Abstraction

Class 3

The Process

Class 4

The Programming Interface

Class 5

Interprocess Communication

Class 6

Concurrency and Threads

Class 7

Locks and Condition Variables

Class 8

Scheduling

Class 9

Advanced Synchronization



Class 10

Address Translation

Class 11

Segmentation and Paging

Class 12

Midterm

Class 13

Virtual Memory

Class 14

Memory Management Application

Class 15

Containerization and Virtualization

Class 16

Disk Devices

Class 17

Introduction to File System

Class 18

File System Cont'd

Class 19

Files and Directories

Class 20

File System Implementation

Class 21

Flash Memory

Class 22

Virtual Machine

Class 23

Data Integrity and Protection

Class 24



Attending Policy

Regular and prompt attendance is required. Under ordinary circumstances, you may miss two times without penalty. Each absence over this number will lower your course grade by a third of a letter and missing more than five classes may lead to a failing grade in the course. Arriving late and/or leaving before the end of the class period are equivalent to absences.

Policy on “Late Withdrawals”

In accordance with university policy, appeals for late withdrawal will be approved ONLY in case of medical emergency and similar crises.

Academic Honesty

Nanchang University expects all students to do their own work. Instructors will fail assignments that show evidence of plagiarism or other forms of cheating, and will also report the student's name to the University administration. A student reported to the University for cheating is placed on disciplinary probation; a student reported twice is suspended or expelled.

General Expectations:

Students are expected to:

- Attend all classes and be responsible for all materials covered in class and otherwise assigned;
- Complete the day's required reading and assignments before class;
- Review the previous day's notes before class and make notes about questions you have about the previous class or the day's reading;
- Participate in class discussions and complete required written work on time;
- Refrain from texting, phoning or engaging in computer activities unrelated to class during the class period;
- While class participation is welcome, even required, you are expected to refrain from private conversations during the class period.

Special Needs or Assistance

Please contact the Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material. Our goal is to help you learn, not to penalize you for issues which mask your learning.